THE LARVA OF THE WEEVIL LIMNOBARIS RECTIROSTRIS LECONTE.

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The material on which the following description is based consists of fifteen mature larvæ of the weevil *Limnobaris rectirostris* LeConte, which kindly were sent to me for description by Mr. Harry B. Weiss, Chief, Bureau of Statistics and Inspection, State of New Jersey, Department of Agriculture, Trenton, N. J. The larvæ were collected at Monmouth Junction, New Jersey, on October 30, 1923, and have now been accessioned to the collection of coleopterous larvæ in the National Museum. When received they were preserved in alcohol. Their natural appearance does not seem to have changed greatly, except that most of them are abnormally extended resulting in the loss of distinct limitations between the different body areas.

DESCRIPTION OF MATURE LARVA.

GENERALITIES:

The larva (fig. 2) is of medium size, about 8 mm. long and 2 mm. wide; it is cylindrical, more elongate than usual in the curculionids and slightly curved.

The head (fig. 6) is yellowish-brown with darker margins and on the dorsal surface with a system of broad whitish bands which form a large figure somewhat like a reversed letter A. Very characteristic is also a dark semi-circular line posteriorly on the dorsal side of epicranium, almost parallel with the outline of the head capsule when this is seen from above.

The body (fig. 2) is mainly whitish as in most other curculionid-larvæ, but anteriorly on each side of the middle line the thin, slightly colored and indistinct prothoracic shield has a yellowish-brownish spot, and likewise on prothorax are found several small patches of yellowish-brown chitinous granulations. The largest of these patches is medianly on eusternum and has the form of a short, broad, squarish kite. The two posterior thoracic and all the abdominal segments are without chitinizations.

The abdominal segments are connected by well developed intersegmental, wedge shaped areas or cunei (cu_1 and cu_2, fig. 2) which are unusually large in the middle of the abdomen, and thereby contribute essentially to the characteristic length of the larva.

Each of the first to eighth abdominal segments has three tergal lobes or pleads. The anterior (psc) of these pleads has a minute seta and the posterior (scl) one carries two setæ of normal size and at least one minute. On the ventral side the sternal regions of these same segments are transversely swollen along their posterior margins probably for the sake of locomotion.

The head and footwarts are beset with several setæ but most of the body-areas carry very few and often extremely fine and short ones.

The spiracles (fig. 9) are "bifore," viz., provided with a pair of air tubes, and are rather small; they are present on mesothorax and the first eight abdominal segments; a rudimentary spiracle can with high power magnification be detected at the anterior margin of methathorax. The mesothoracie spiracle is slightly larger than the abdominal ones, it points obliquely upward and backward and the area in which it is seated is pushed into the posterior part of prothorax; however, there is a considerable distance between it and the anterior margin of prothorax. The abdominal spiracles are all of same size and point directly backward; the eighth one placed slightly more dorsal than the rest.

HEAD:

Is connected with the body by a large cervical collar and due to this membrane it may be deeply invaginated as well as greatly protruded from prothorax. From anterior margin of frons to the occipital foramen it is as long as wide.

Epicranial median suture somewhat longer than half of cranium. Epicranial ridge (ecc fig. 6) curved, extending from posterior end of epicranial suture forward to about the middle of the cranium and is subparallel with the lateral outlines of the head, when this is viewed from above. Each epicranial half with six setæ arranged as shown in figure 6.

Ocelli (figs. 2, 6) two on each side, both reduced to pigmented optical spots. The first and decidedly the larger spot is placed

near the antenna; the second spot is behind the first and nearer than this to the middle line, is indistinct and about of the same size as one of the sensory punctures.

Frons about two-thirds the length of the epicranial suture; frontal sutures form an angle of about 120°; median frontal carina (fc fig. 6) strong. Four minute setæ on each side on the anterior frontal margin and two long setæ on each side of the frontal plate behind its anterior margin; the arrangement and relative size of the setæ as shown in the figure; about five sensory punctures on each side.

Antenna (fig. 1) very small, two-jointed. Basal joint (b) not higher but considerably wider than the apical joint, with four minute setæ and one seta as long as the apical joint. Apical joint (a) conical, without seta.

Clypeus transverse; length to width about as 1 to 3; width about half as large as distance between antennæ; widest behind; lateral margins convex. No setæ but three sensory punctures.

Labrum transverse, anterior margin convex; extreme length medianly, about as long as clypeus; width about three times the length. Dorsal face of labrum (fig. 6) on each side with three setæ, one of normal size, the two others small. Along the anterior margin on each side with a lateral group of three short, stout setæ and a median group of two of about same shape but slightly shorter. Ventral face (or epipharynx) with two setæ, one (e^1) anterior and thick, the other (e^2) posterior and fine and placed inside of the anterior end of the epipharyngeal rod (er fig. 7).

Mandible subtriangular (figs. 4, 5, 7), somewhat larger at base than apically; inside concave, gouge shaped; distally with five teeth, external tooth on ventral side (5 fig. 5, 7) small; inner dorsal margin anteriorly with a low, heel like projection (h figs. 4, 5, 7). One seta above the middle of external face; a few sensory punctures on dorsal face.

Maxilla (figs. 3, 8) with cardo (ca) smooth, yellowish-brown and no seta. Stipes proper (st), smooth, yellowish brown with one seta and several sensory punctures. Palpiger (g) soft, retracible; with two setæ on ventral face and two small setæ on the dorsal (buccal) face. Maxillary lobe (or mala) single, large,

reaching to the middle of apical joint of palpus; on the ventral face with several minute setæ; on the buccal face with about ten stout setæ mostly of medium length (m fig. 8). Maxillary palp (p) short, with two joints; basal joint a little longer and about twice as wide as the apical, which is conical, obtuse and about one-half time longer than wide; basal joint with about three minute setæ and some sensory punctures; apical article finely papillose at the tip; with one puncture.

Subfacial area (sf fig. 3) undivided, probably formed by a fusion of the mental, submental and maxillary articulating areas; it carries one well developed seta and two minute setæ and also a patch of yellowish-brown, chitinous granulations on each side.

Labial stipites (fig. 3 and stil fig. 10) are amalgamated medianly and the fused formation is posteriorly limited by an unpaired, anteriorly concave, biarcuate, in the middle spear like chitinization; one long seta on the middle of each labial stipes. Ligula thick and short; ventral surface (li) with one seta, dorsal surface (ln) without seta.

Paragnatha (pgt fig. 8), a setose lobe; anteriorly slightly projecting over basal corner of ligula.

Hypopharynx (hyp figs. 8 and 10) membranous, on each side supported by a chitinous rod (hr) which at the entrance to œsophagus is connected with the corresponding rod from epipharynx (er fig. 7).

THORAX:

Tergum of prothorax simple with the different tergal areas very slightly indicated. Prescutal region with a shining yellowish-brown coloration on each side and one seta; scuto-scutellar region with two setæ and alar region without any. Meso- and metathorax with tergum divided into two folds or pleads, one formed by the prescutum and the other by the scuto-scutellum and the alar area. Prescutum (psc) with one seta; scuto-scutellum (sc-scl) with one distinct seta and besides with two very small setæ above and one very small seta below this seta; alar area (a) with one minute seta.

Epipleurum (e fig. 2) of prothorax large, triangular, glabrous, situated in front of tergum and above hypopleurum and separated

from this area by the ventro-lateral suture. Questionable if the spiracle carrying area belongs to pro- or to mesothorax; possibly it is a fused region formed by an anterior, spiracle-carrying upper part of the mesothoracic pre-epipleurum and the prothoracic post-epipleurum. Below the spiracle is a small, arched, dorsally concave patch of chitinous granulations. The mesothoracic pre-epipleurum proper (ea) is large, triangular, with one seta. Mesothoracic post-epipleurum (eb) narrow, elongate, situated behind the alar area (a); no seta. The metathoracic pre-epipleurum and post-epipleurum similar to the corresponding mesothoracic areas; anteriorly in upper corner of the metathoracic pre-epipleurum is a rudimentary metathoracic spiracle.

The hypopleural and sternal areas of all the thoracic segments are similar in position, shape and size.

Hypopleurum (hy) situated below the ventro-lateral suture, semioval with the upward curved margin dorsal; one or two fine setæ present.

Presternum wanting in front of each segment; eusternum (est) large, unpaired, triangular; with one minute seta on each side. Prothoracic eusternum with a squarish large patch of chitinous granulations. Parasternum (or coxal lobe) (cx), representing the leg, triangular with rounded swelling below hypopleurum; four or five either normal or small setæ present. Poststernellum (post) transversal, bandlike, with small median pit; glabrous.

ABDOMEN:

The first eight abdominal segments almost identical in every respect; the two last segments somewhat modified and reduced in size.

Tergum divided into prescutum (psc), scutum (sc), scutellum (scl) and postscutellum (cu^1) which later is fused with or entirely constituting the upper cuneus of the intersegmental region. The ventral portions of the scutal and scutellar areas are fused together and form a spiracle bearing region which corresponds to the alar area (a) of the meso- and metathoracic segments. Prescutum (psc) with one fine seta; scutum proper (sc) without any; scutellum proper (scl) with two setæ; the ventral subdivision of scutum and ventral subdivision of scutellum carry each one min-

ute seta; postscutellum (cu^1) glabrous.

Epipleurum (e) ventrally limited by the ventro-lateral suture; median region or epipleural lobe with one seta; anterior or pre-epipleural region glabrous; posterior or post-epipleural region glabrous.

Hypopleurum (h) below the ventro-lateral suture, semioval with one normal and one minute seta.

Presternum wanting. Eusternum (est) subquadrangular, posteriorly transversely swollen; with one minute seta, not found on all segments. Parasternum (or coxal lobe) (cx) triangular; with one minute seta. Sternellum not developed. Poststernellum (cu^2) transverse, bandshaped, glabrous, functioning as articulating skin, forming the lower cuneus of the intersegmental region.

Ninth abdominal segment smaller than the foregoing segments, with areas less distinct; setæ almost normal in arrangement and number.

Tenth abdominal segment small, wart shaped, with terminal round anus (an); two well developed setæ and a few minute ones.

Spiracles (fig. 9) bifore, with two rather short airtubes (t); each of these with about five incomplete annuli; spiracular opening circular (o).

Closing apparatus near the spiracle proper; consists of a well developed arm (a^1) and a very short one (a^2), a fleshy (c) and a hard and sharp plead or valve (s) and a muscle (m) between the arms.

COMMENTS:

In 1920 the present author contributed a description with a plate of the larva of the cornpit weevil *Geræus* (=*Centrinus*) *penicellus* (Herbst)*. This genus belongs according to the characters found in imago to the same tribe, *Centrinides*, as does the *Limnobaris*. The systematic characters of the larvæ of the two genera corroborate this classification; but the larvæ differ noticeably in general habitus.

The principal characters in common for the two genera are the following:

* Journal Econ. Ent., vol. 13, 1920, p. 277-280.

Epicranium with posterior curved ridge (ecc).

Mandible with five apical teeth and the inside of the mandible concave.

Abdominal prescutum, scutum and scutellum all well developed on the mediodorsal side of the body.

Body sparsely beset with setæ. Prescutum with a single seta and scutellum with two or three well developed setæ.

Postscutellum and poststernellum forming a broad or very broad intersegmental region (cu).

Spiracles typically bifore; airtubes with few (about five) annuli; all spiracles located on side of body.

The principal characters separating the two genera are the following:

Head capsule in *Limnobaris* dorsally with a system of broad, whitish bands which form a large figure somewhat like a letter A; in *Geræus* without.

Prothorax in *Limnobaris* with patches of brownish chitinous granulations below the thoracic spiracle, above the footwarts, and medianly on eusternum. In *Geræus* without.

Body of *Limnobaris* comparatively much longer than in *Geræus* due to the much broader intersegmental regions in the former genus.

Eight abdominal spiracle in *Limnobaris* of the same size as the other abdominal spiracles; in *Geræus* somewhat larger and placed more dorsal than the rest.